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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,398	10/22/2001	Jorg-Erich Sorg	1999P1711	9756

7590

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EXAMINER

LEURIG, SHARLENE L

ART UNIT PAPER NUMBER

2879

DATE MAILED: 02/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,398

Applicant(s)

SORG, JORG-ERICH

Examiner

Sharlene Leurig

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-17 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-14 and 17, drawn to an LED light source, classified in class 313, subclass 512.
 - II. Claims 15 and 16, drawn to a method of manufacturing an LED light source, classified in class 445, subclass 23.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the LED may be produced by curing the resin and then forming a lens out of a molten material on the surface of the cured resin.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
5. During a telephone conversation with Werner Stermer on February 3, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-14 and 17. Affirmation of this election must be made by applicant in replying to

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this Office action. Claims 15 and 16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 9, 10, 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Kano et al. (3,875,456) (of record). Kano discloses an LED light source comprising a basic body formed with a recess (Figure 2, element 1), an LED (A) disposed in the recess, a filling of a transparent material (2) embedding the LED and a converter substance in the transparent material (column 3, lines 46-50), a lens-like resin layer functioning as a lens (6) in contact with the filling (2), the lens having a concave underside and the upper side of the filling in a form fit with the underside of the lens, giving the filling a convex shape.

The Examiner notes that the claim limitation of the lens being obtained by means of prefabrication and then being placed on the filling prior to a final curing of the filling is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

Regarding claim 2, Kano discloses an LED where the volume of the filling is less than a free volume of the recess with the LED disposed inside. Regarding claim 9, the LED is a surface-mounted component on the bottom surface of the recess (1).

Regarding claims 10 and 11, Kano discloses a filling of an epoxy resin, which is a resin material (column 4, line 10). Regarding claim 14, Kano discloses a recess with sloping, reflective sidewalls (column 3, line 11; Figure 2, element 1).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5, 6, 12, 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Kano et al. (3,875,456) (of record) in view of admitted prior art (admission). Kano discloses an LED light source with a conversion layer to convert light of a chosen wavelength emitted from the LED to a light of another chosen wavelength, and cites several examples (columns 4 and 5).

However, Kano lacks explicit disclosure of a blue light emitting LED based on GaN and a conversion layer to convert the emitted light to the yellow spectral range.

However, the applicant's disclosure teaches the common combination of a blue-light emitting diode based on GaN with a conversion layer producing yellow light (page 3, line 21 to page 4, line 4).

Therefore regarding claim 5, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kano's LED with a blue-light emitting diode and a conversion layer that converts the emitted light to yellow light in order to produce the desired lighting effect.

Kano also lacks explicit disclosure of an ultraviolet light emitting LED and a conversion layer to convert the emitted light to the visible spectral range.

However, the applicant's disclosure teaches the common combination of an ultraviolet light emitting diode (page 3, line 21) and its conversion to a longer wavelength (page 3, line 25) as in the visible range (page 2, line 5).

Therefore regarding claim 6, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kano's LED with an ultraviolet-light emitting diode and a conversion layer that converts the emitted light to visible light in order to produce the desired lighting effect.

Kano lacks a basic body containing thermoplastic material as well as two leadframes.

However, the applicant's disclosure teaches the use of thermoplastic material in the basic body of LED's in the art (page 3, line 8) as well as two leadframes, the first carrying the LED at a first electrical contact area and the second connected to a second electrical contact area of the LED by a bond wire (page 3, lines 1-7).

Therefore regarding claims 12 and 13, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kano's LED with a thermoplastic material for the body and two leadframes for providing electrical

connections to the LED in order to provide sufficient stability and electrical connections for long-lasting operability of the LED.

10. Claims 3, 4, 7, 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano et al. (3,875,456) (of record) in view of Miller et al. (6,155,699). Kano discloses an LED light source with all the limitations discussed above, including a lens in contact with a convex filling and having a concave underside complementary to the convex upper side of the filling, but lacks a convex filling surface and an underside surface of a lens both formed at a constant distance from the LED or the geometrical center point of its active radiating area.

However, Kano discloses the need for a light source emitting "clear and distinct colors" (column 2, line 1). Furthermore, it is well known in the optical art to improve the quality of emitted light from light sources.

Miller teaches an LED light source having a convex wavelength-converting element (Figure 2, elements 28, 30 and 36) at a constant distance from the LED (column 3, lines 43-46; column 7, lines 5-9). The active region of the LED chip is at the top of the LED chip (column 3, lines 49-50), so the geometrical center of the active area is also at a constant distance from the convex surface of the wavelength-converting element. Miller teaches this configuration as a means to provide an LED light source improved in brightness and efficiency.

Therefore regarding claims 3 and 4, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kano's LED light source with a constant distance between the LED and the convex surface of the filling in order to provide an LED with even light distribution.

Regarding claim 17, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kano's LED light source with a filling having a convex upper surface at equidistant points from the LED in order to provide an LED with even light distribution.

Kano also lacks disclosure of the degree of conversion along the optical path. However, Kano discloses the need for a light source emitting "clear and distinct colors" (column 2, line 1). Furthermore, it is well known in the optical art to improve the quality of emitted light from light sources.

Miller teaches an LED configuration resulting in a conversion efficiency of greater than 60%, the maximum conversion efficiency of the prior art (column 2, lines 3-7 and 51-55). The distance between the LED and the convex wavelength-converting element (Figure 2, elements 28, 30 and 36) is integral to this achievement (column 7, lines 5-9). The active region of the LED chip is at the top of the LED chip (column 3, lines 49-50), so the geometrical center of the active area is also at a constant distance from the convex surface of the wavelength-converting element and is also therefore integral to this achievement. Since the aim of the art is to improve the degree of conversion, the greater conversion percentage of Miller's teaching than the claimed conversion percentage is taken to be a matter of finding the optimum value.

It would have been obvious to one having ordinary skill in the art at the time of the invention to aim for a 50% conversion degree, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum value involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Furthermore, regarding claims 7 and 8, it would have been obvious to

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
one of ordinary skill in the art at the time of the invention to modify Kano's LED light source with a conversion efficiency percentage of 50% in order to improve the light quality of the LED source to an acceptable degree to suit a given standard.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (703)305-4745. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703)305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Sharlene Leurig
February 4, 2003



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